AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1 –6.   (Cancelled)

7.   (Currently Amended)   ~~The personal authentication method of claim 1, wherein~~ A personal authentication method using iris images, comprising a registration process and an authentication process,

the registration process ~~includes~~ including the steps of:

~~acquiring~~ capturing, by a capture device, a plurality of iris images having different pupil opening degrees from [[the]] a registrant;

obtaining feature data and a ratio of pupil diameter to iris diameter from each of the plurality of iris images and associating the obtained ratio of pupil diameter to iris diameter with the corresponding obtained feature data;

obtaining a ~~relational~~ polynomial expression ~~between~~ defining the feature data ~~and~~ as a function of the obtained ~~a pupil diameter/iris diameter~~ ratio of pupil diameter to iris diameter based on a plurality of pieces of feature data and ~~pupil diameter/iris diameter~~ ratios of pupil diameter to iris diameter obtained from the plurality of ~~acquired~~ captured iris images, wherein a degree of the polynomial expression is greater than or equal to 2; and

registering parameters for expressing the ~~relational~~ polynomial expression in [[the]] an iris database in conjunction with the registrant, and

the authentication process ~~includes~~ including the [[step]] steps of:

capturing, by a capture device, an iris image from a person to be authenticated;

obtaining feature data and a ratio of pupil diameter to iris diameter of the person to be authenticated from the acquired iris image;

obtaining a ~~relational~~ the polynomial expression from the parameters registered in the iris database ~~in conjunction with~~ corresponding to the [[a]] registrant and applying ~~assigning~~ the ~~pupil diameter/iris diameter~~ ratio of pupil diameter to iris diameter obtained in the authentication process to the ~~relational~~ polynomial expression of the registrant to obtain [[the]] feature data to be collated;

comparing the feature data to be collated with the feature data obtained from the person to be authenticated in the authentication process to determine whether or not the person to be authenticated is the registrant; and

outputting the comparing result through an output device.

8.   (Previously Presented)   The personal authentication method of claim 7, wherein:

the registration process includes the step of reducing the number of the parameters before registration; and

the authentication process includes the step of restoring the reduced number of parameters by interpolation.

9 – 10.   (Cancelled)

11.   (Currently Amended) A personal authentication method using iris images, comprising:

a first step of capturing, by a capture device, an iris image from a person to be authenticated;

a second step of obtaining feature data and a ~~pupil diameter/iris diameter~~ ratio of pupil diameter to iris diameter, of the person to be authenticated, from the iris image obtained at the first step;

a third step of ~~using the pupil diameter/iris diameter ratio of the person to be authenticated to obtain the feature data, as feature data to be collated, that is associated with the pupil diameter/iris diameter ratio of the person to be authenticated from feature data registered in an iris database in which data registration has been done using pupil diameter/iris diameter ratios~~ obtaining a polynomial expression from parameters registered in an iris database in conjunction with a registrant, the iris database storing parameters which express the polynomial expression as defining feature data of the registrant as a function of a ratio of pupil diameter to iris diameter of the registrant, wherein a degree of the polynomial expression is greater than or equal to 2; and

a fourth step of applying the ratio of pupil diameter to iris diameter obtained at the second step to the polynomial expression thereby obtaining feature data to be collated;

a ~~fourth~~ fifth step of comparing the feature data to be collated which is obtained at the third step with the feature data obtained at the second step to determine whether or not the person to be authenticated is ~~a claimed~~ the registrant; and

a ~~fifth~~ sixth step of outputting the comparing result through an output device.

12 – 14.   (Cancelled)

15.   (Currently Amended)   An iris registration device which performs data registration for iris authentication, comprising:

means for acquiring a plurality of iris images having different pupil opening degrees from a registrant;

means for obtaining feature data and a ~~pupil diameter/iris diameter~~ ratio of pupil diameter to iris diameter from each of the plurality of iris images and associating the obtained ~~pupil diameter/iris diameter~~ ratio of pupil diameter to iris diameter with the corresponding obtained feature data;

means for ~~using the pupil diameter/iris diameter ratios to index the obtained feature data of the registrant~~ obtaining a polynomial expression defining the obtained feature data as a function of the obtained ratio of pupil diameter to iris diameter based on a plurality of pieces of feature data and ratios of pupil diameter to iris diameter obtained from the plurality of acquired iris images, wherein a degree of the polynomial expression is greater than or equal to 2; and

means for ~~performing data registration for the registrant including storing the obtained feature data, the pupil diameter/iris diameter ratios, and index relationship between the obtained feature data and the pupil diameter/iris diameter ratios, of the registrant, in an iris database~~ registering parameters for expressing the polynomial expression in an iris database in conjunction with the registrant.

16.   (Currently Amended)   An iris authentication device which performs personal authentication using iris images, comprising:

means for acquiring an iris image from a person to be authenticated;

means for obtaining feature data and a ~~pupil diameter/iris diameter~~ ratio <u>of pupil diameter to iris diameter</u>, of the person to be authenticated, from the acquired iris image;

means for ~~using the pupil diameter/iris diameter ratio of the person to be authenticated to obtain the feature data, as feature data to be collated, that is associated with the pupil diameter/iris diameter ratio of the person to be authenticated from feature data registered in an iris database in which data registration has been done using pupil diameter/iris diameter ratios~~ <u>obtaining a polynomial expression defining feature data of a registrant as a function of a ratio of pupil diameter to iris diameter of the registrant from parameters registered in an iris database corresponding to the registrant and applying the obtained ratio of pupil diameter to iris diameter to the polynomial expression to obtain feature data to be collated, wherein a degree of the polynomial expression is greater than or equal to 2</u>; and

means for comparing the feature data to be collated with the feature data obtained from the person to be authenticated to determine whether or not the person to be authenticated is ~~a claimed~~ <u>the</u> registrant.

17.   (Currently Amended) A memory encoded with a program for instructing a computer to execute personal authentication using iris images, comprising the steps of:

obtaining feature data and a ~~pupil diameter/iris diameter~~ ratio of pupil diameter to iris diameter, of [[the]] a person to be authenticated, from an iris image acquired from [[a]] the person to be authenticated;

~~using the pupil diameter/iris diameter ratio of the person to be authenticated to obtain the feature data, as feature data to be collated, that is associated with the pupil diameter/iris diameter ratio of the person to be authenticated from feature data registered in an iris database in which data registration has been done using pupil diameter/iris diameter ratios~~ obtaining a polynomial expression defining feature data of a registrant as a function of a ratio of pupil diameter to iris diameter of the registrant from parameters registered in an iris database corresponding to the registrant and applying the obtained ratio of pupil diameter to iris diameter to the polynomial expression to obtain feature data to be collated, wherein a degree of the polynomial expression is greater than or equal to 2; and

comparing the feature data to be collated with the feature data obtained from the person to be authenticated to determine whether or not the person to be authenticated is ~~a claimed~~ the registrant.

18.   (New)   The method of claim 1 wherein the obtained feature data is an output of a Gabor filter, such that the polynomial expression defines the output of the Gabor filter as a function of the ratio of pupil diameter to iris diameter.